

Amendments to the Specification:

Please replace paragraph [0008] with the following amended paragraph:

[0008] In additional aspects of ~~the present invention~~certain preferred embodiments, various methods of increasing crop production using a starch graft copolymer produced by one of the above-described methods are disclosed. One method involves applying the granulated starch graft copolymer directly to the soil. A second method involves coating a root or seed with the granulated starch graft copolymer. The application of starch graft copolymers, made by the above-described methods, directly to the soil results in earlier seed germination and/or blooming, decreased irrigation requirements, increased propagation, increased crop growth, increased crop production, and decreased soil crusting. Thus, starch graft copolymers made by the above-described methods offer advantages over the prior art methods for forming and using an SAP in large-scale agriculture.

Please replace paragraph [0009] with the following amended paragraph:

[0009] There are ~~two~~multiple preferred methods of making the SAP products ~~of the present invention~~. In ~~the~~a first method, the SAP product is prepared and rod-shaped starch graft copolymers are formed from a viscous alkali starch graft copolymer. The alkali starch graft copolymers of this ~~invention~~ are preferably produced by graft polymerizing grafting reactants onto a starch. The grafting reactants of ~~this invention~~may include an acrylonitrile and an initiator. The starch may be any starch, flour, or meal. The preferred starch is gelatinized cornstarch. The acrylonitrile may be used alone or in conjunction with other monomers commonly used in the industry. The preferred weight ratio of the starch to the acrylonitrile is in the range of between about 1:2 and about 1:5. The acrylonitrile is graft polymerized onto the starch in the presence of an initiator, preferably a ceric (+4) salt. A preferred initiator is ceric ammonium nitrate, however, other suitable initiator systems known to those skilled in the art may be used. The polymerization is accomplished in several minutes, producing long, grafted chains of polyacrylonitrile (or polyacrylonitrile with other monomers) attached to the starch.

Please replace paragraph [0012] with the following amended paragraph:

[0012] The first method differs from the second method of forming the granular SAP product of the ~~present invention~~ preferred embodiment in that the second method does not use alcohol to effect precipitation. In the second method, an acid-base precipitation occurs followed by separation and neutralization to form a viscous mass that is formed into rod-shaped particles and allowed to air- or oven-dry before screening or grinding.

Please replace paragraph [0013] with the following amended paragraph:

[0013] According to the second method of forming the granular SAP product of the ~~present invention~~ preferred embodiment, once the alkali starch graft copolymer is saponified as described above with reference to the first method, the saponificate is precipitated by adding acid until a pH of between about 2.0 and about 3.5, more particularly about 3.0 is reached. The precipitate is then washed, preferably with water, to remove any salts and, if necessary, is separated. Separation methods include settling, centrifuging, and any other mechanical means of separating. The carboxylic acid of the starch graft copolymer is then titrated back to the alkali form with the hydroxide of an alkali metal, preferably potassium hydroxide, to a pH of between about 6.0 and about 8.0, more particularly about 7.0. This viscous mass may then be forced through a die plate, dusted to remove tackiness, and air- or oven-dried. The dried particles are then screened to the appropriate size. If desired, the particles could be ground to a fine powder then formed into pellets of the desired size for use in agriculture.

Please replace paragraph [0014] with the following amended paragraph:

[0014] The SAP product formed by either the first or second method preferably has a particle size of less than about 200 mesh. The most preferred particle size will depend on the specific agricultural application intended. The preferred particle size for agricultural applications that deposit the starch graft copolymer directly into the soil is less than 50 mesh, more particularly between about 5-mesh to about 50-mesh, or even more particularly between about an 8-mesh to about 25-mesh. This particle size is preferred because the commercially available granular applicators in the industry require this particle size. In order to broadcast or meter the absorbent particle through existing

application equipment, an 8-mesh to about 25-mesh SAP product having a density of between about 30 to about 35 pounds per cubic foot is preferred.

Please replace paragraph [0016] with the following amended paragraph:

[0016] The results of the use of the SAP product produced by the methods of the ~~present invention~~preferred embodiments will be demonstrated in the following examples and tables. Particle sizes between about 8 mesh and about 25 mesh were evaluated on cantaloupe, cotton, and tomato plants, with subsequent field evaluations of 40 additional crops.

Please replace paragraph [0019] with the following amended paragraph:

[0019] In the prior art, the starches used to form SAPs were cornstarch, wheat starch, and sorghum starch. The resulting absorbent starch or flour graft copolymers exhibited the ability to absorb a few hundred times to about 1,000 times their weight in water. As part of the ~~present invention~~preferred embodiment, several starches and flours not previously evaluated for their ability to form absorbent starch graft copolymers were analyzed, including corn meal, peeled yucca root, unpeeled yucca root, oat flour, banana flour, and tapioca flour. Absorbent starch graft copolymers were made from these materials, and the water absorbency of each was determined. The results are provided in TABLE 1. Although the absorbent starch graft copolymers were made with two polymerizable monomers (acrylonitrile (AN) and 2-acrylonitrile-2-methyl-propanesulfonic acid (AMPS)), acrylic acid, and acrylamide could also be used.

Please replace paragraph [0053] with the following amended paragraph:

[0053] The following examples are intended only to further illustrate the ~~invention~~certain preferred embodiments and are not intended to limit the scope of the invention, which is defined by the claims.

Please replace paragraph [0072] with the following amended paragraph:

[0072] It is to be understood that the foregoing detailed description ~~of the invention~~ is given by way of illustration and that modification and variations may be made therein without departing from the spirit and scope of the invention. Consequently, it will

be obvious to those having skill in the art that many changes may be made to the details of the above-described embodiments without departing from the underlying principles of the invention. The scope of the present invention should, therefore, be determined only by the following claims.